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THE ROAD TO *REMEMBRANCE*

by Barbara Bullard, MA

Barbara Bullard has been a Professional Member of The Monroe Institute since 1989. She was selected for the 1986-87 edition of Who's Who of Scholars in American Community Colleges. *In 1994 Barbara was nominated for Teacher of the Year at Orange Coast College where she has been a professor of speech for twenty-nine years and received the NISOD Teaching Excellence Award from the University of Texas. Professor Bullard is known for her innovative approach to teaching, communications, relationships, leadership, and healing. Her deep involvement with the Hemi-Sync sound technology and three decades of research, testing, and teaching about the impact of speech, sound, and music on the brain were the impetus for a three-year effort to create a superlearning* METAMUSIC.

The road to a new *METAMUSIC* product, *Remembrance*, began over eighteen years ago when I discovered the "suggestopaedia" techniques of Dr. George Lozanov (Ostrander and Schroeder, *Superlearning*, 1979). As a professor of Interpersonal Communications, any methods to help my students learn faster or better interest me. That's why, for over a decade, I've recommended background music as a key element to catalyze "superlearning." Chapters 3 through 7 of *Communicating from the Inside Out*, coauthored with Kat Carroll, MA, discuss using whole-brain learning techniques—affirmations, visualization, music, and breathing—for anchoring information to the widest possible combination of neural networks and thus increasing retention.

Reading about the Hemi-Sync technology of The Monroe Institute in spring, 1988, I was intrigued from the outset. My students ordered a variety of the *MIND FOOD* and *H-PLUS* learning tapes. The rapid results were amazing. Attendance at a *GATEWAY VOYAGE* that summer led to a quantum leap in my personal growth and teaching style. Joining the Professional Division and attending the 1989 Professional Seminar familiarized me with Hemi-Sync and the new *METAMUSIC* products. *METAMUSIC* and *H-PLUS* became integral parts of my superlearning workshops. My students gave me feedback on Hemi-Sync's benefits and limitations. These are thoroughly addressed in *Using the Whole Brain*, edited by Ronald Russell. So I'll focus on why a new *METAMUSIC* was desirable and its evolution.

Music easily anchors new information by widespread stimulation of neuronal pathways. It is the only outside stimulus which automatically synchronizes the two brain hemispheres. While the linear-sequential aspects, such as lyrics, beat, rhythm, and notation are being processed by the left hemi-

sphere, the right hemisphere processes the holistic aspects, such as harmony, intonation, creativity, and the overall flow.

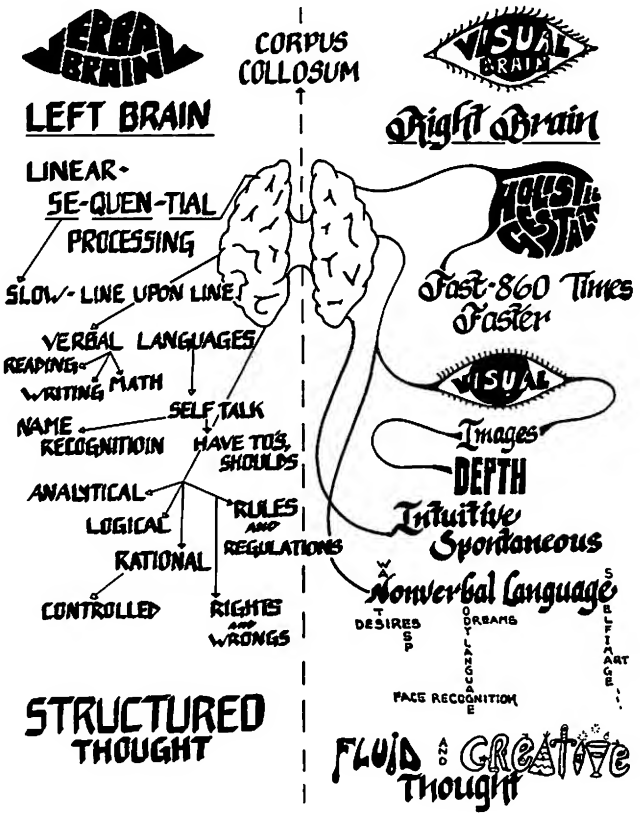
However, music reaches far beyond the cerebral hemispheres. Brain imaging research has turned the spotlight on the "convergent zones" in the prefrontal lobes. Here the interconnectivity of the two hemispheres occurs and arouses the "executive" brain of coordinated thinking patterns. Simultaneously with side-to-side and front-to-back stimulation, a top-down process runs to the limbic brain, where our emotions are triggered. This emotional energy affects the immune system chemistry. The influence of music on brain and body is so pervasive that musicologist Dr. David Tame states: "To the question, 'Does music affect man's physical body?' modern research replies in the clear affirmative. There is scarcely a single function of the physical body that cannot be affected by musical tones" (*The Secret Power of Music*, 1984, p. 136). In his insightful book, *Stalking the Wild Pendulum*, Itzhak Bentov comments: "The universe is a vibrating, dancing organism. . . . In a word, both the universe as a whole and we in particular are not matter but music." Music's synergistic interaction with so many areas of the brain makes certain types of background music conducive to enhanced learning.

Dr. Oliver Sacks observes the pervasive influence of music in the article "Healing Vibrations" from *The Yoga Journal*, January/February 1994. "The ability of most Parkinson's patients to respond to music remains remarkably unimpaired. They may be unable to walk, but able to dance; unable to speak, but able to sing. Even just imagining music will do the trick. Rosalie apparently knows all of Chopin by heart. Sacks need only mention Opus 49 and her body, posture, and expression are transformed. The Parkinsonism seems to vanish, and even her EEG reverts to normal 'as the F-Minor Fantasie plays itself in her mind. . . .' Somehow, says Sacks, listening to music activates an 'internal natural music' that keeps all aspects of brain function working together" (p. 61).

Recent research from the University of California at Irvine adds further confirmation. Thirty-six college students listened to a Mozart sonata, a musical relaxation tape, and silence for fifteen- minute periods before taking three different IQ tests. The Mozart music variable produced an average IQ score of 119, compared to 111 for the relaxation tape and 110 for silence. *Newsweek* reporter Joshua Cooper Ramo questioned: "What is the magic of Mozart's flute? One theory is that the intricate musical structures resonate in the brain's dense web, lubricating the flow of neurons. Another is that the neural structure includes regular firing patterns that build along the surface of the brain like bridges. Mozart's musical structure evokes a sympathetic resonance from the brain the way one vibrating piano string can set another humming" (*Newsweek*, October 1993).

Many of us learned our ABCs and other concepts in elementary school by singing them and still remember those tunes. If you're driving along in a car and the first three beats of an "oldies" song plays on the radio, you remember the lyrics almost immediately. You may even recall your boy or girlfriend of that time and how you felt about them. It is an axiom: what goes in with music comes out with music. Research is making it ever clearer that music is a vital key to maintaining physical health and enhancing mental functioning. But it must be the *right kind* of music to facilitate learning and retention. Our new *METAMUSIC* was designed with the intention of incorporating the newest findings from the fields of neuroscience and cognitive science.

Let's focus on that specific design and intent. *Remembrance METAMUSIC* has been especially crafted as a



musical environment for quantum learning, peak performance, and the creative flow experience. A beta frequency is embedded to keep one alert and stimulated. Therefore, as a rule, the tape is not suitable for relaxation or meditation. To aid retention, the appropriate beta brain-wave frequencies were carefully chosen. The frequency on Side A, *Concentration*, is the same as that of *MIND FOOD Concentration*. The musical format replaces the "white noise" which may trigger an electromagnetic "buzz" that irritates and distracts most young listeners.

Side B, *Attention*, uses a faster beta frequency to assist a more rapid exchange of information between the hemispheres. Over the past several years, Professional Member Robert Sornson, EdS, and The Monroe Institute have investigated this frequency with individuals diagnosed with Attention Deficit Disorder (ADD). Recent findings point toward lack of a coordinated hemispheric brain-wave pattern in ADD. Bob is executive director of special education for Northville Public Schools and writes: "Generally, individuals with a diagnosed attention deficit demonstrate lower levels of glucose metabolism in the brain. It can be shown that these individuals generally use less oxygen across the cerebral cortex of the brain and produce brain-wave patterns that are somewhat slower than those of their peers in the general population. These facts add up to indicate that people with an attention deficit have difficulty maintaining high levels of brain arousal associated with sustained alertness and focused attention. Using an audio technology called Hemi-Sync, we have been exploring ways to enhance attention using sound patterns that are specifically designed to increase the level of alertness." Our joint preliminary investigations indicate that, although certain younger people prefer one side or the other of *Remembrance*, most adults cannot detect a difference. They can play it on auto-reverse as background as long as they need an alert focus.

The increased beta brain-wave entrainment underlying

Remembrance METAMUSIC may also help with learning disabilities such as dyslexia and slow reading development. Both have, as an underlying cause, a disparity in timing between the two hemispheres. *Brain-Mind Bulletin* of April 1990 noted: "While reading, most good readers have left-hemisphere readings in the beta range (around 13 hertz) and mid-range amplitude. Dyslexics, on the other hand, tend to have left hemisphere measurements in the alpha (roughly 10 hertz) and higher-than-average amplitudes, although some have unusually low amplitude. . . . The cerebellum of dyslexics has not yet 'learned' the coordination and timing involved in internal balance of the body." The *Brain-Mind Bulletin* for March 1991 highlighted research indicating that "the ability to switch rapidly between hemispheres may be hallmarks of higher intelligence. . . . Gifted children . . . have a profound 'switching' ability between hemispheres." *Remembrance* promotes this desirable rapid processing partnership for those with challenges and for the gifted among us.

The current generation of schoolchildren tends to be more impulsive, mentally restless, distractible and spontaneous. Rapid switches in stimuli from electronic media lead them to expect constant stimulation. The brain's software has been rewired by mass media bombardment. The average American child watches approximately 6,000 hours of television by age five and continues to spend more time watching TV than in school (Jane A. Healy , "Endangered Minds," 1990). *Remembrance* is suited to help this generation of students learn to focus, concentrate, anchor, and retain the essential information for reading, writing, and mathematics.

When addressing a learning problem, begin by studying with *Remembrance* on stereo headphones. If this is too distracting for some individuals, play it in the background. It will have a stereo effect in either case. *Remembrance*'s tempo and rhythm match the faster heart rates of young listeners. Slower-paced music tends to slow the heart rate and bores them. Fortunately, the faster pace seems to coincide with an optimal heart rate for adults in the superlearning state. Five to ten times greater retention and recall is possible in line with superlearning parameters (Ostrander and Schroeder, *Superlearning*, 1979). Bell chime rhythms, crickets, and several other refrains are interspersed to assist in wider anchoring of information. The enchanting musical theme was composed with much love and talent by J. S. Epperson, a University of Southern California music major, with my guidance. A second superlearning *METAMUSIC* centered around the Mozart selection cited in the UCI study is in progress.

The technology underlying *Remembrance* is founded on the genius of Robert Monroe and his thirty-year refinement of Hemi-Sync. Both TMI audio engineer Mark Certo and Robert Sornson made crucial contributions to its design. We hope you'll enjoy this cooperative effort and keep us informed of the results as you use *Remembrance*.

[*Speech-language pathologist Suzanne Evans Morris, PhD, specializes in multi-sensory techniques to enrich the learning environment and the therapeutic setting. Her presentation at the 1989 Professional Seminar on using* METAMUSIC *with autistic and learning-disabled children stimulated my own departure from "standard" superlearning modalities. Remembrance is dedicated to Suzanne's parents, David Le Count Evans and Mary Catherine Evans, who both died in the month before the 1993 professional meeting. Its title was given during a very profound laboratory* PREP *session.*]

HEMI-SYNC INTO CREATIVITY

by Chok C. Hiew, PhD

Chok C. Hiew holds a PhD from the University of Colorado and is currently professor of psychology at the University of New Brunswick, Canada. He has been a Professional Member of The Monroe Institute since 1991. Dr. Hiew's academic publications reflect his interests in community and health issues as well as in international psychology. His long-term aspiration is to build bridges between science and intuition. This paper, presented at the 1994 Professional Seminar, advances that aspiration.

Hemi-Sync proponents have long assumed that this sound technology is linked to the intuitive process and that one of its benefits is enhanced creativity. There is plenty of self-reported and anecdotal evidence that one effect of Hemi-Sync is a shift to a more creative state. Yet, to date, there has not been a single published scientific study objectively demonstrating this relationship.

Premise

This paper reports a pilot study designed to test the impact of Hemi-Sync audiotapes on creative responses and divergent thinking. Two Hemi-Sync tapes were used. In Session I, the *Deep 10 Relaxation* tape was used to induce a deep state of physical and mental relaxation. In Session II, after repeating the *Deep 10* tape for the first 6.5 minutes, subjects spent the remainder of the session listening to the *Surf* tape. *Surf* consists of the sounds of ocean waves and Hemi-Sync with no verbal instructions. It was predicted that after listening to this Hemi-Sync tape in Session II, subjects would show the best performance when evaluated for creativity.

Design of Study

College students from an introductory psychology course were randomly assigned to an experimental (Hemi-Sync, n = 10) or a control group (n = 9). The subjects presented themselves in the sleep lab in two sessions separated by a week in time. The Hemi-Sync Group listened to the tapes described above. The Control Group listened to the same tapes without the Hemi-Sync tones. Both groups listened to *Deep 10 Relaxation* in Session I and a combination of partial *Deep 10* (for the first 6.5 minutes) followed by the entire *Surf* tape in Session II.

Evaluation Measures

After listening to the tapes, subjects were evaluated in several ways. In Session I, a Subjective Experience Questionnaire was completed to assess how subjects felt about the experience. The Guilford Test of creativity was then administered. Common objects were named (e.g., pencil, shoe, button, etc.) and subjects responded by listing as many alternate uses for these objects as possible. Three objects were presented prior to listening to the tape (Prime items), and three others were presented after the tape (Unprimed items).In Session II, the same tests were administered with the addition of a Doodles Test. Subjects were asked to draw a doodle representing what they were thinking about while listening to the tape.

Scoring

The items in the Subjective Experience Questionnaire were rated by subjects on a seven-point scale. In the Guilford Test, responses were coded in three ways:

1. Alternate Uses: Refers to the frequency of acceptable alternate uses for each object. Inappropriate and redundant uses were not counted.
2. Fluency: Refers to the total responses, including redundant responses. It is a measure of the speed of producing responses.
3. Flexibility: Refers to the frequency of creative shifts in the different use categories for each object.

The Doodles Test in Session II was coded by rating each doodle in terms of its degree of divergence from a single theme, i.e., how **different** was the drawing from the original theme or experimental situation. In this case, the situation was a subject lying on the floor listening to the sounds of ocean waves. Other dimensions, such as complexity, abstractness, and artistry were ignored. A five-point rating scale was used to code for the degree of divergent thinking.

FIGURE 1

GUILFORD ALTERNATIVE USES MEASURE SHOWING THE GROUPS (HEMI-SYNC VS CONTROL) PERFORMANCE FOR PRIME AND UNPRIMED ITEMS.

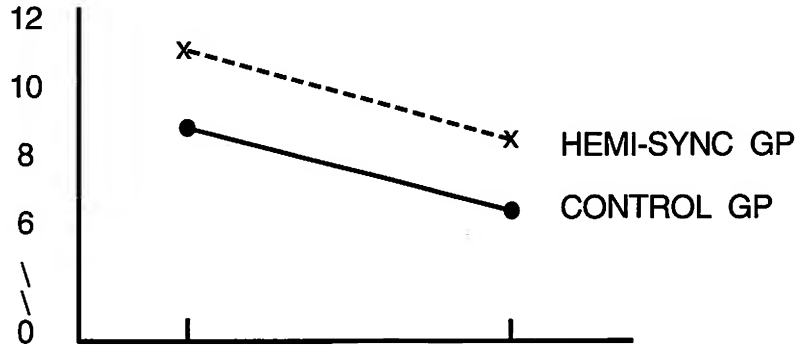
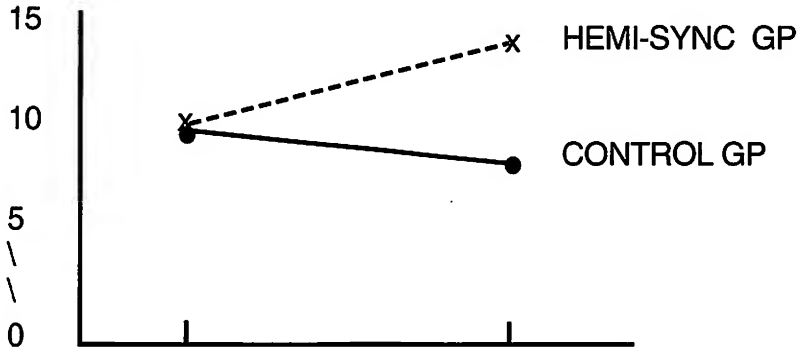


FIGURE 2

GUILFORD TEST OF CREATIVITY (FLEXIBILITY OR CREATIVE SHIFTS MEASURE) SHOWING THE GROUPS X SESSION INTERACTION.



Results

1. Subjective Experience Questionnaire

In general, subjects in both sets of conditions and both sessions found the tapes to be positive experiences as well as highly relaxing. However, the Session I *Deep 10* tape

> ...when listening to *Surf* with Hemi-Sync tones embedded, subjects apparently thought about matters far removed from the actual physical and auditory situation.

(regardless of the presence or absence of Hemi-Sync tones) was significantly more positive and more relaxing than *Surf*. Within each session, no difference was found between the Hemi-Sync and the Control subjects. For an item rating whether they slept during the tape, Session II subjects listening to *Surf* were more likely to feel that they were awake than when listening to *Deep 10* in Session I. Overall, these findings suggest that Session II subjects listening to the *Surf* tape were awake but relaxed prior to the creativity tests.

2. Guilford Test of Creativity

Subjects' responses were rated by two raters (with one being totally blind to the conditions), and the inter-rater agreement for the various groups ranged from .89 to .96. The Multiple Analysis of Variance (MANOVA) was conducted using a General Linear Models procedure with Repeated Measures to test the hypothesis. The significant findings were:

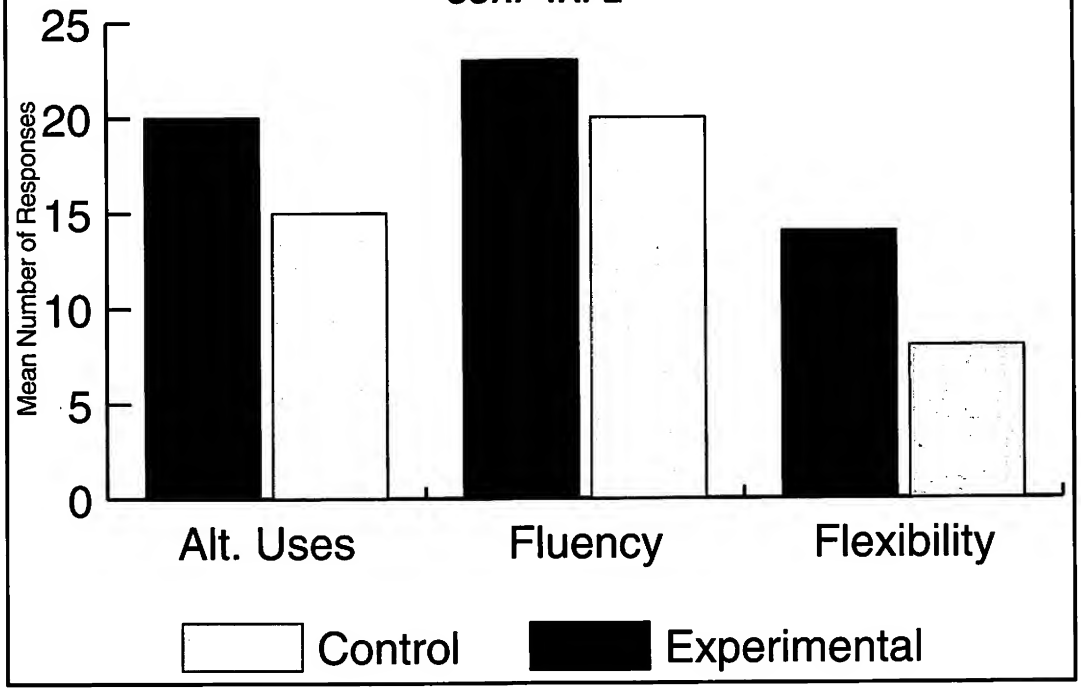
(a) Alternate Uses: There was a significant Sessions effect with subjects improving from Session I to II [$F(1,10.34) = 5.70$, p .03]. The Groups Main effect was also significant for the number of acceptable responses [$F(1,26.23) = 5.03$, p .04], indicating that Hemi-Sync subjects were generating more uses than the Control subjects. For Prime versus Unprimed scores, a highly significant mean effect for Groups was found [$F(1,8.38) = 11.75$, p .003]. For both Prime and Unprimed items, the Hemi-Sync subjects were generating more responses compared to the Control subjects (see Figure 1).

(b) Fluency: The total number of responses (ignoring repetitions of similar uses) did not show a significant difference. This implied that in terms of speed of production of creative responses, the Hemi-Sync subjects were no faster than the Controls.

(c) Flexibility: There was a significant Groups Main effect [$F(1,11.20) = 9.48$, p .006], with the Hemi-Sync Group showing a higher number of creative "shifts" in categories of uses than the Controls. Furthermore, there was a Groups x Sessions interaction [$F(1,49.32) = 9.71$, p .006]. Here, Hemi-Sync subjects generated more "shifts" or a greater degree of flexibility from Session I to Session II, whereas the opposite trend was found for the Control Group (see Figure 2).

Figure 3 summarizes the effects of Hemi-Sync on the three creativity measures after listening to the *Surf* tape in Session II. Basically, the Hemi-Sync tones predictably increased the generation of alternate uses and category shifts (but not the speed of production) according to the Guilford creativity measures.

FIGURE 3: GUILFORD ALTERNATIVE USES *SURF* TAPE



3. Doodles Test of Creativity

Please note that the coding scheme for evaluating doodles was developed post hoc, after conducting the study. However, the rating scheme was highly reliable since there was almost perfect agreement between the author and another rater blind to the conditions (r = .90).

It was clear that the doodles from the Hemi-Sync subjects were on themes that differed distinctly from the experimental theme (listening to ocean waves). In contrast, the doodles of most subjects in the Control Group focused predominately on a single theme, i.e., drawings of waves with sun and clouds and/or bodies lying on the ground/beach.

During the presentation of this study at The Monroe Institute's 1994 Professional Seminar, twenty participants from the audience were co-opted as raters and all had mean scores that were consistently greater in divergent thinking for Hemi-Sync subjects than the Controls.

Discussion

This exploratory study confirmed the prediction that not only do Hemi-Sync tapes (specifically *Deep 10 Relaxation*) produce a deep state of relaxation in the users but also a unique quality of Hemi-Sync (specifically *Surf*) is the enhancement of a creative state. The Doodles Test demonstrated that when listening to *Surf* with Hemi-Sync tones embedded, subjects apparently thought about matters far removed from the actual physical and auditory situation. Their thinking was highly divergent. This state subsequently seemed to produce improved performance in creativity. Performance during the Guilford Test showed that they were indeed more creative in the sense of responding with more alternate acceptable uses. In addition, they reliably generated more creative "shifts" in the number of unique categories of uses after listening to the *Surf* tape.

While these results provide some evidence of the impact of Hemi-Sync on creativity, this first study is exploratory in nature. Further research is planned with a larger sample of subjects. It will incorporate baseline measures of creativity prior to Hemi-Sync intervention together with other measures of creative problem-solving.

[*Dr. Hiew expresses his heartfelt thanks to his colleague Dr. Donald Fields for making this study a reality through his "C-1" support and supervision of Julie MacPherson in data collection and also to Dan Hare for his assistance in data analysis. A replication of this study incorporating* METAMUSIC *Remembrance is in progress*]

THANK YOU

Please accept our deepest appreciation for your continuing generous support of The Monroe Institute. Your contributions allow us to move forward in our research, and expand the frontiers of human consciousness development for the benefit of our growing global community.

HEMI-SYNC(R) Journal

Editor: Shirley Bliley

The **HEMI-SYNC JOURNAL**, a publication of The Monroe Institute, an educational and research organization dedicated to exploring and developing the uses and understanding of human consciousness, offers current reporting on research and application of the Hemi-Sync® technology in a variety of professional fields.

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